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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: SUSTAINED IMPROVER OF MUSCULAR FATIGUE

(57) Abstract: A long-acting improver of muscular fatigue characterized by comprising 4 kinds of amino acids made up of leucine, isoleucine, valine and glutamine, and a whey protein component (whey protein and/or decomposition product of whey protein). At least one of a whey protein isolate (WPI), a whey protein concentrate (WPC),  $\beta$ -lactoglobulin, and  $\alpha$ -lactalbumin is used as the whey protein. Novel food or drink, and pharmaceuticals which exhibit sustained recovery effects on muscular fatigue are provided.

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# INTERNATIONAL SEARCH REPORT

International Application No.

PCT/JP 03/15429

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A23L1/305 A23L2/66 A61K38/04 A61K38/17

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A23L A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, FSTA

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 687 782 A (BRANTMAN EUGENE R) 18 August 1987 (1987-08-18) claims 1-24; example 1 ---	2-16
Y	FR 2 758 243 A (AJINOMOTO KK) 17 July 1998 (1998-07-17) claims 1-10 ---	1-16
Y	WO 99 49741 A (NESTLE SA ;BOZA JULIO (CH); BALLEVRE OLIVIER (CH); FINOT PAUL ANDR) 7 October 1999 (1999-10-07) page 1, line 31-33 page 3, line 4-13; claims 1-10 ---	1-16
A	WO 00 64283 A (WHITE PHILIP) 2 November 2000 (2000-11-02) page 11; claims 1-10 ---	1-16
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

\*A\* document defining the general state of the art which is not considered to be of particular relevance

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\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

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\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*Z\* document member of the same patent family

Date of the actual completion of the international search

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 03/15429

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DATABASE WPI Section Ch, Week 199632 Derwent Publications Ltd., London, GB; Class B05, AN 1996-316268 XP002271047 & JP 08 140628 A (MEIJI MILK PROD CO LTD), 4 June 1996 (1996-06-04) abstract ----	1-16
A	DATABASE WPI Section Ch, Week 199641 Derwent Publications Ltd., London, GB; Class B03, AN 1996-408309 XP002271048 & JP 08 198748 A (AJINOMOTO KK), 6 August 1996 (1996-08-06) cited in the application abstract ----	1-16
A	PATENT ABSTRACTS OF JAPAN vol. 010, no. 036 (C-328), 13 February 1986 (1986-02-13) & JP 60 186261 A (AJINOMOTO KK), 21 September 1985 (1985-09-21) cited in the application abstract ----	1-16
A	EP 0 747 395 A (CLINTEC NUTRITION CO) 11 December 1996 (1996-12-11) claims 1-10 ----	1-16
A	US 5 641 531 A (LIEBRECHT JEFFERY WAYNE ET AL) 24 June 1997 (1997-06-24) claims 1-15 ----	1-16
A	DE 298 08 637 U (OEKOMAG NET GMBH) 16 July 1998 (1998-07-16) page 4; claims 1-10 ----	1-16
A	GB 2 335 134 A (STALPLEX LIMITED) 15 September 1999 (1999-09-15) page 5; claims 1-26 -----	1-16

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/JP 03/15429

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
  
Although claim 16 is directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP03/15429

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4687782	A	18-08-1987	NONE	
FR 2758243	A	17-07-1998	JP FR	9023825 A 2758243 A1
				28-01-1997 17-07-1998
WO 9949741	A	07-10-1999	AT AU BR CA CN DE DK WO EP ES ID	237957 T 3142099 A 9909234 A 2326148 A1 1134227 B 69907170 D1 1065947 T3 9949741 A1 1065947 A1 2195555 T3 27818 A
				15-05-2003 18-10-1999 28-11-2000 07-10-1999 14-01-2004 28-05-2003 14-07-2003 07-10-1999 10-01-2001 01-12-2003 26-04-2001
WO 0064283	A	02-11-2000	AU WO CA EP US	4280600 A 0064283 A1 2306720 A1 1176880 A1 6346264 B1
				10-11-2000 02-11-2000 27-10-2000 06-02-2002 12-02-2002
JP 8140628	A	04-06-1996	JP	3425813 B2
				14-07-2003
JP 8198748	A	06-08-1996	NONE	
JP 60186261	A	21-09-1985	JP JP	1762260 C 4058304 B
				28-05-1993 17-09-1992
EP 0747395	A	11-12-1996	US AT CA DE EP JP	5728678 A 239037 T 2177195 A1 69627748 D1 0747395 A1 9020678 A
				17-03-1998 15-05-2003 07-12-1996 05-06-2003 11-12-1996 21-01-1997
US 5641531	A	24-06-1997	AT AU AU CA DE DE DK EP ES JP NO NZ WO	234568 T 699318 B2 6910696 A 2231653 A1 69626833 D1 69626833 T2 852468 T3 0852468 A1 2195007 T3 11512604 T 981380 A 316793 A 9711614 A1
				15-04-2003 03-12-1998 17-04-1997 03-04-1997 24-04-2003 24-12-2003 07-07-2003 15-07-1998 01-12-2003 02-11-1999 26-03-1998 29-06-1999 03-04-1997
DE 29808637	U	16-07-1998	DE	29808637 U1
				16-07-1998
GB 2335134	A	15-09-1999	IE IE	980707 A1 980708 A2
				09-02-2000 04-10-2000